

DEVELOPMENT MANAGEMENT OF COMPANY'S INNOVATIVE- ENCOURAGING ENVIRONMENT ON THE BASIS OF INNOVATIVE CULTURE FORMATION

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Abstract

Article focuses on formalized approach elaboration to the management of formation process and innovative culture development of an enterprise. It also specifies content of management procedures. The approach to the selection of management actions depending on the state of components of subsystems and elements of innovation culture is developed and tested. The economic-mathematical model for tools and methods structure optimization of the enterprise innovative culture formation and development is proposed and tested.

Keywords: innovation culture, innovation-friendly environment, formation of innovative culture.

Introduction

The internationalization of the world economy, which manifests itself in the strengthening of the interconnection and mutual influence of individual national markets, gradually leads to unification of global economy subjects into a single market of goods, services, capital and labor. Consequences of that process is that it forces domestic companies at a certain stage of their maturity to face the need to join new external markets.

The international market is characterized by high level of competition both between individual companies and between countries, high dynamics of development and a high degree of knowledge intensity and innovation, characteristics of consumer behavior, as well as the specifics of products and services offered on this market. Therefore, companies seeking to join the world market are constantly forced to improve their products, expand the range and quality of services, optimize production and management processes, and use all available resources and tools that allow them to counter competition, which is constantly growing.

One of the main prerequisites for the effectiveness of enterprise innovation activity is certain degree of innovative culture presence that determines the personnel ability to perceive, develop and make innovations, use them in their activities, promote creative potential of employees, motivate them to achieve the highest results, etc. Under such conditions it becomes crucial to actualize the task of developing effective mechanisms for purposeful management of innovative culture formation and development processes.

Many recent publications investigate creational and development issues of corporate (organizational) culture, including innovation. In particular, D. Boddy and R. Peyton [3], E. Shane [9] classified the types of

enterprise and institution organizational cultures, S. Kaplan [16] revealed approaches to transformation of the traditional organizational structure into an innovative one. K. Cameron and R. Quin [5] highlighted approaches to diagnosis of organizational culture. T. Samonova [8] considered organizational culture as an element of the marketing communications complex, which forms the image of the organization. V. Balabanov [1] and S. Bekonya [2] explored the role of the society innovative culture in shaping the innovation-friendly environment in the country. Publications of G.M. Zakharchin, O.Ya. Andriychuk [4], L.Patory, N.A. Cymbalists [7], O. Laricheva [6] discuss approaches to modeling the innovative culture of the enterprise, its formation and development as the basis of the potential innovation growth.

Despite the considerable number of scientific works and the breadth of the issues under consideration, we still have significant issues in providing effective system for managing processes of innovation culture formation and development at the level of individual companies as one of the main elements of their innovation-friendly environment. At the same time, the system of management measures should be based on results of its current state diagnostics in relation to the specific conditions of management in selected target markets.

The purpose of the article is to develop theoretical and methodological principles for management of the enterprise innovative culture formation and development based on its state diagnostics.

1. Elaboration of a practical-oriented algorithm for managing the process of enterprises (companies) innovative culture formation and development

The transition of Ukraine to the innovative way of development is completely logical due to the evolution of the innovation activity management system and has a certain list of external and internal factors.

Taking into account recent scientific publications, authors have developed a generalized practical-oriented algorithm for managing the process of enterprises (companies) innovative culture formation and development. The consolidated scheme of this algorithm is shown in Figure 1.

At the first stage of the proposed algorithm we evaluate the innovation culture of the company by individual elements, individual components, and then in general. In order to do, you can use a methodological approach developed by the authors [10].

The second stage of the algorithm dedicated to the diagnosis of innovation culture current state and determination of the need for managing decisions to ensure its proper level [11].

On the third stage we provide details how to manage innovative culture: its subsystems and their elements. Moreover, we provide forecast of costs for their implementation and expected results [15].

The next, fourth stage, involves optimization of tools and methods structure for formation and development of the company innovation culture [15].

Implementation of measures in order to develop the company innovation culture while controlling their costs and results takes place at the fifth stage. After that, a reevaluation of innovation culture state is carried out (return to the first stage of the proposed algorithm).

2. Diagnosis of company innovation culture state.

In this chapter we consider (according to the proposed algorithm) specific procedures for managing the processes of innovation culture formation and development based on the example of PE "Promenergomash".

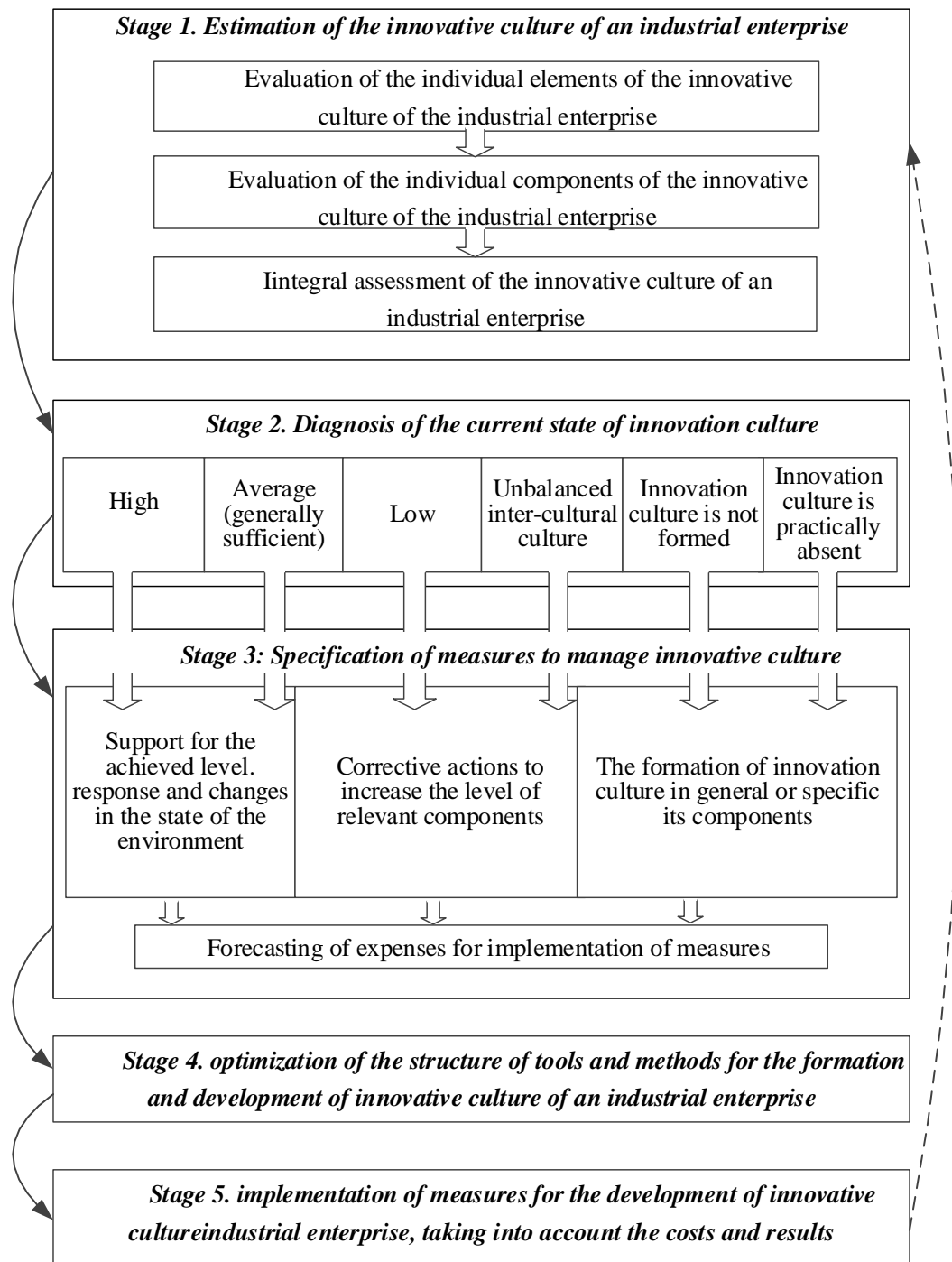


Figure 1. Scheme of a generalized algorithm for managing the process of innovation culture formation and development

Since indicators of the components of an innovative culture can be both quantitative and (mainly) qualitative [13], it is proposed to evaluate them by an expert method in points, for example, on a 10-point scale (ascending order). The scale proposed in Fig. 2.

The expert evaluation results using the author's method [9] of the PE "Promenergomash" innovation culture state are presented in the table 1. As experts we consider top management and leading specialists of the company, as well as representatives of consumers. The consistency of expert opinions was verified using the concordance factor.

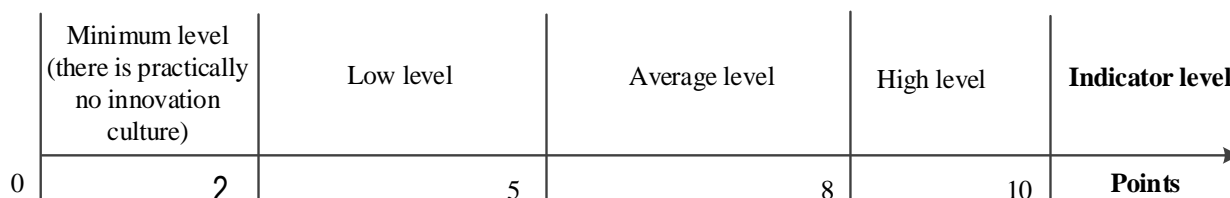


Figure 2. Scale for assessing the state of company innovation culture components (developed by the authors)

Table 1. Evaluation of PE Promenergomash innovative culture organizational component (developed by the authors)

Criterion	Value
1. Considering the interests of employees	8,19
2. Susceptibility of the organization to unexpected, non-trivial decisions	7,81
3. Flexible work schedule	8,19
4. Favorable working and rest conditions	7,19
5. Practical orientation of personnel activity	8,13
6. Flexibility of organizational management structures	8,13
7. Mobility of vertical and horizontal communications and personnel movements	7,81
8. Freedom of communication and information transfer	8,31
9. Democratic style of management	7,44
10. Maintaining the balance between preserving traditions and their modification	8,44
Integral score $I_{org.p}$, points	7,96
Normalized assessment of the $I_{org.}$	2

Table 2. Estimation of PE Promenergomash innovation culture motivational component (developed by the authors)

Criterion	Value
1. Recognition and career: a sense of the demand for knowledge, experience, etc.	7,00
2. Creativity and initiative: the demand for innovations and innovators	7,13
3. Freedom of work and creativity: freedom of creativity from political, religious, bureaucratic and other restrictions	6,94
4. Image of the pioneer: the legal protection of copyrights	7,56

5. Material goods: high pay for labor results	7,19
6. Innovation Business: Involve Innovators in Profit	6,94
7. Psychological comfort: tolerant attitude of colleagues and leadership, employment guarantees	6,81
8. Recognition and fame: recognition and gratitude of colleagues, leadership, the general public	7,31
Integral score <i>Imot.p</i> , points	7,11
Normalized <i>Imot</i>	2

Table 3. Estimation of PE Promenergomash innovative culture intellectual and creative component (developed by the authors)

Критерій	Значення
1. Ability to go beyond the available knowledge and experience	7,56
2. Desire and ability to convey knowledge, skills, experience, etc. students and colleagues	7,63
3. The desire for self-realization and recognition	7,25
4. Focus on the outcome of	7,13
5. Effectiveness of labor	7,19
6. Ability to predict under uncertainty	6,19
7. Ability to prolong mobilization and concentration of	6,25
8. Continuous self-study and self-improvement	7,56
Integral score <i>Int.-cr.p</i> , points	7,00
Normalized evaluation of <i>Int.-cr.</i>	2

In order to be used in the innovative culture management decision-making process, integrated estimates of innovation culture components (as well as their elements) should be normalized [13]. Normalization rates are given in the table. 4

Table 4. Value of assessments on different scales (developed by the authors [12])

Score by order scale	Score (S)	Normalized score
Minimum level (there is practically no innovation culture)	$1 \leq S < 2$	0
Low level	$2 \leq S \leq 5$	1
Average level	$5 < S \leq 8$	2
High level	$8 < S \leq 10$	3

Diagnosis of innovation culture state is proposed to be carried out according to the scheme presented in Figure 3.

Taking into account the data of the tables 1-3 and recommendations from figure 3, we make following management decisions concerning development of industrial enterprise innovative culture:

- innovation culture state of the industrial enterprise is on an average level (in general sufficient);
- corrective actions are needed to increase the level of relevant components and compare them with major competitors' innovation culture states in order to make such corrections.

3. Development of measures to increase the level of innovation culture.

In accordance with the recommendations [14] and taking into account the results and assessments of the current state of innovation culture, which was evaluated by an expert method, it was possible to identify a set of measures and corrective actions for the development of innovative culture (Tables 5-7).

Normalized assessments of the components of an innovative culture			The state of innovation culture	Management decisions
Iorg.	Imot.	Iint.-cr.		
3 2 3 3	3 3 2 3	3 3 3 2	High	Support for the achieved level. response to changes in the state of the environment
3 2 2 2	2 3 2 2	2 2 3 2	Average (generally sufficient)	Corrective action to improve the relevant components
1 3/2 1 1	1 1 3/2 1	1 1 1 3/2	Low	Comparison with the state of innovative culture of the main competitors and the introduction of appropriate corrections
3/2/1 3/2/1 0	3/2/1 0 3/2/1	0 3/2/1 3/2/1	Unbalanced	Formation of components of innovative culture ($I_i = 0$). Increase the level of components $I_i \geq 1$
3/2/1 0 0	0 3/2/1 0	0 0 3/2/1	Futility	Formation of innovative culture taking into account its individual elements
0	0	0	Missing	Formation of innovation culture taking into account the presence of its individual elements formation of innovation culture "from zero"

Figure 3. Recommendations on the choice of actions to manage the components of innovation culture (developed by the authors)

Table 5. Measures aimed at the development of the organizational component of the innovation culture (developed by the authors)

Ingredient of innovative culture	Measures to develop components of innovative culture	Cost, UAH	Estimated increase of the indicator, marks
1.1. Taking into account the interests of employees	Conducting a questionnaire of employees to determine their needs, review and correct (if necessary) their official duties	1000	0.5
1.2. Susceptibility of the organization to unexpected, non-trivial decisions	Monitoring the development of events in the external micro and macro environment, adjusting the organizational structures of management	2000	1

1.3. Flexible schedule of work	Predictability of the possibility of implementing an individual work schedule for certain categories of employees, incl. possibility to work at home	5000	0.5
1.4. Favorable working and rest conditions	Creation of recreation areas, observance of the schedule of work and rest of employees, provision of work places with necessary furniture and equipment	4000	0,5
1.5. Practical orientation of the activities of the staff	Maintaining the achieved level. The existing system as a whole is satisfactory	1000	1
1.6. Flexibility of organizational management structures	Revision of organizational structures of management: combining design-oriented structure with pulsating, as such that provides flexibility and high efficiency	10,000	1
1.7. Mobility of vertical and horizontal links and personnel movements	Formation of the policy of informational openness, bringing the functional responsibilities of employees in line with the new organizational structures of management, promotion of employees through the results of their work	14000	1
1.8. Freedom of communication and information transfer	Creating on-line receptions for operational problem solving, providing communication with staff of the company	8000	2
1.9. Democratic style of management	Extending the practice of engaging staff to discuss and make managerial decisions	7000	2
1.10. Maintaining the balance between preserving traditions and their modification	The existing system as a whole is satisfactory, explaining to the staff the need to make adjustments to existing principles for the formation and development of corporate culture	1500	1

Table 6. Measures aimed at the development of the motivational component of the innovation culture (developed by the authors)

Ingredient of innovative culture	Measures to develop components of innovative culture	Cost, UAH	Estimated increase of the indicator, marks
2.1. Recognition and career: a sense of the demand for knowledge, experience, etc.	The introduction of a system of surcharges for seniority, level of qualification. Awarding the best employees with bonuses and certificates	17000	2
2.2. Creativity and initiative: the demand for innovations and innovators.	Granting of individual grants for the development and implementation of new projects.	6000	1
2.3. Freedom of work and creativity: freedom of creativity from political, religious, bureaucratic and other restrictions.	Providing greater freedom of personnel in choosing methods for solving tasks, choosing work schedules, etc.	8000	2
2.4. Image of the discoverer: legal protection of copyright	Unconditional provision of developer rights to scientific and technical products created by them	3000	1
2.5. Material goods: high pay for labor results	Implementation of the "Regulation" on encouraging employees for the high results of their innovation-oriented activities	5000	0.5

2.6. Innovation Business: Involve Innovators in Profit	Provision of Warranties on Legal Protection of Copyright Innovators	10000	1
2.7. Psychological comfort: tolerant attitude of colleagues and leadership, employment guarantees.	Maintaining the achieved level. The existing system as a whole is satisfactory	6000	1
2.8. Recognition and Glory: Recognition and Gratitude of Colleagues, Leadership, and the Public	Introduction of the System of Moral Stimulation of Innovators	4000	1

Table 7. Measures aimed at the development of the intellectual and creative component of innovation culture (developed by the authors)

Ingredient of innovative culture	Measures to develop components of innovative culture	Cost, UAH	Estimated increase of the indicator, marks
3.1. Ability to go beyond the existing knowledge and experience	Conducting trainings for staff on the application of formalized methods for generation and selection of innovative ideas	10,000	0.5
3.2. The desire and ability to convey knowledge, skills, experience, and others students and colleagues	The existing system is generally satisfactory. Implementation of the practice of mentoring experienced staff in relation to newcomers	5000	1
3.3. Striving for self-realization and recognition.	Maintaining the achieved level. Existing system as a whole satisfactory	3000	1
3.4. Focus on the result	Implementation of the internal-firm rating of employees and units that affects their career growth and remuneration	2500	1
3.5. Effectiveness of labor		4800	1
3.6. Ability to predict under uncertainty	Conducting trainings for personnel on the application of methods for forecasting trends in science and technology, changes in consumer demand, etc.	6300	1.5
3.7. Ability to prolong mobilization and concentration	Implementation of personnel selection and testing system, training	8200	2
3.8. Continuing self-study and self-improvement	Participation in seminars and conferences	9000	2

Optimization of tools and methods structure for the formation and development of industrial enterprise innovative culture should be carried out using the modification of the author's economic-mathematical model [15].

Calculations of the economic-mathematical model after its concretization by the data given in the table. 4-6 are performed by the authors using the program Microsoft Excel (function "Solution"). It was taken into account that the maximum assessment level of innovation culture state of is equal to 10, the maximum amount

of funding allocated for their implementation was 110 thousand UAH. The results of the calculations are shown in Fig. 4/

After implementation of measures determined by the optimization model, the level of innovation culture of PE "Promenergomash" will increase from 7.0 points to 8.23 points (from medium to high).

Taking into account that the level of innovation culture of PE "Promenergomash" has increased to a high level (according to Figure 2) - 8.23 points, the management of the enterprise is invited to further support the achieved level, and promote its increase.

Measures to raise the level of innovative culture of PP "Promenergomash"								
Organizational component			Motivational component			Intellectual and creative component		
№	implementation costs	forecast increase of the indicator	№	implementation costs	forecast increase of the indicator	№	implementation costs	forecast increase of the indicator
1	1000	0,5	1	17000	2	1	not implemented	--
2	not implemented	--	2	6000	1	2	5000	1
3	5000	0,5	3	8000	2	3	3000	1
4	4000	0,5	4	3000	1	4	not implemented	--
5	not implemented	--	5	5000	0,5	5	4800	1
6	not implemented	--	6	not implemented	--	6	6300	1,5
7	not implemented	--	7	6000	1	7	8200	2
8	8000	2	8	not implemented	--	8	9000	2
9	7000	2	9	not implemented	--	9	not implemented	--
10	1500	1	10	not implemented	--	10	not implemented	--
Base level component:		7,96	Base level component:		7,11	Base level component:		7,32
Level after the events:		8,59	Level after the events:		8,07	Level after the events:		8,07
Maximum amount of money:		110000	Level IK up to events:			7,32		
Amount of funds for the implementation of selected		107800	Level IK after the events:			8,23		

Figure 4. Measures to increase the level of innovative culture of PE Promenergomash (developed by the authors)

Figure 4 shows that for investigated enterprise the optimization requirements concerning the growth of individual component levels of subsystems and innovation culture as a whole are followed. Therefore, not only the overall level of innovation culture has been increased, but the value for all individual components has also been increased.

Conclusions

Finally, it is necessary to note:

- authors have developed generalized algorithm for managing the process of enterprise innovation culture formation and development with the content of its procedures;
- we propose modified scheme of management decision-making process, as well as choice of actions necessary to perform on enterprise innovative culture components taking into account results of its condition diagnostics (including the state of its separate subsystems and their elements);

- using procedures developed by the authors the practical experiment of managing the process of enterprise innovative culture formation and development have been carried out; results suggested a set of recommendations for increasing its level;

- basing on proposed by authors economic-mathematical model of tools and methods structure optimization for the enterprise innovation culture formation and development (using the program Microsoft Excel, the function "The solver"), a set of management measures that allow to achieve the maximum possible innovation culture level increase under conditions of limited financial resources has been selected.

Further research should be aimed at improving the organizational and economic mechanism for the formation of an innovative and supportive environment in the enterprise, based on the development of its innovation culture, taking into account the specifics of its activities.

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